

## WHAT IS CLAIMED IS:

- 1 1. In an ATM network, in which ATM traffic is carried on a  
2 physical network adhering to a physical layer protocol, a  
3 method of switching traffic transported on a working entity  
4 of said ATM network to a protection entity on said ATM  
5 network comprising:
  - 6 a) monitoring an indicator of signal degrade of said working  
7 entity provided by said physical layer protocol;
  - 8 b) in response to detecting a degraded signal as a result of  
9 said monitoring, generating ATM cells indicative of said  
10 signal degrade on said ATM network.
- 1 2. The method of claim 1, further comprising:
  - 2 c) in response to said ATM cells indicative of said signal  
3 degrade, receiving said traffic on said protection  
4 entity.
- 1 3. The method of claim 2, further comprising:
  - 2 d) in response to said ATM cells indicative of said signal  
3 degrade, transmitting said traffic on said protection  
4 entity from a source network element.
- 1 4. The method of claim 1, wherein said physical network  
2 comprises a synchronous optical network ("SONET").
- 1 5. The method of claim 4, wherein said monitoring comprises  
2 calculating a bit-error-rate from SONET path overhead.
- 1 6. The method of claim 5, wherein said calculating utilizes a  
2 parity check field within said SONET path overhead to  
3 determine said bit error rate.

1 7. The method of claim 6, wherein said ATM cells indicative of  
2 signal degrade are generated in response to said bit-error-  
3 rate exceeding a defined threshold.

1 8. The method of claim 7, wherein said ATM cells comprise ATM  
2 alarm indication signal ("AIS") cells.

1 9. The method of claim 8, wherein said AIS cells are  
2 transmitted from a network element detecting said signal  
3 degrade to a downstream network element using an ATM  
4 signaling channel.

1 10. The method of claim 9, wherein said ATM signaling channel  
2 comprises an ATM protection switching channel.

1 11. The method of claim 7, wherein said ATM cells comprise an  
2 ATM protection switching coordination protocol ("CP") cell.

1 12. The method of claim 11, wherein said CP cell is  
2 transmitted within one of said working entity and said  
3 protection entity.

1 13. A network element for use in an ATM network, in which ATM  
2 traffic is carried on a physical network adhering to a  
3 physical layer protocol, said network element operable to  
4 cause traffic transported on a working entity of said ATM  
5 network to be transported on a protection entity on said ATM  
6 network, said network element comprising:

7 a detector for monitoring an indicator of signal degrade  
8 of said working entity provided by said physical layer  
9 protocol.

1 14. The network element of claim 13, wherein said detector  
2 generates a trigger indicative of signal degrade in response

3 to monitoring signal degrade of said working entity.

1 15. The network element of claim 14, further comprising an  
2 ATM switch, in communication with an ATM processor, wherein  
3 said detector is in communication with said ATM processor,  
4 and wherein said ATM processor generates ATM cells  
5 indicative of signal degrade in response to said trigger.

1 16. The network element of claim 13, wherein said ATM cells  
2 comprise ATM alarm indication signal ("AIS") cells.

1 17. The network element of claim 14, wherein said ATM cells  
2 comprise an ATM protection switching coordination protocol  
3 ("CP") cell.

1 18. The network element of claim 16, wherein said AIS cells  
2 are transmitted to a downstream network element using an ATM  
3 signaling channel.

1 19. A network element for use in an ATM network, in which ATM  
2 traffic is carried on a physical network adhering to a  
3 physical layer protocol, said network element operable to  
4 switch traffic transported on a working entity of said ATM  
5 network to a protection entity on said ATM network, said  
6 network element comprising:

7 means for monitoring an indicator of signal degrade at  
8 said physical layer of said working entity provided by  
9 said physical layer protocol;

10 means for generating ATM cells indicative of signal  
11 degrade in response to said means for monitoring signal  
12 degrade at said physical layer.

1 20. Computer memory storing program instructions, adapting an  
2 ATM network element on ATM network in which ATM traffic is

3 carried on a physical network adhering to a physical layer  
4 protocol, to:

- 5 a) monitor an indicator of signal degrade of a working  
6 entity on said ATM network provided by said physical  
7 layer protocol;
- 8 b) in response to detecting a degraded signal as a result of  
9 said monitoring, generate ATM cells indicative of said  
10 signal degrade on said ATM network.

1 21. An ATM cell comprising an alarm indication signal  
2 ("AIS"), embodied in a carrier wave to be transported on an  
3 ATM network, said cell comprising:

- 4 a) a field identifying said cell as an ATM AIS cell;
- 5 b) a field including an indicator of signal degrade on said  
6 network.

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